



1 **EC TYPE-EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 94/9/EC

3 Certificate Number: **Sira 00ATEX2085X** Issue: **6**

4 Equipment: **DIN 19234 Shaft Encoder and
4-20 mA Tachometer Shaft Encoder**

5 Applicant: **Hohner Automation Limited**

6 Address: Whitegate Road
Units 14, 15 and 16
Whitegate Industrial Estate
Wrexham, Clwyd, LL13 8UG

7 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 Sira Certification Service, notified body number 0518 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in the confidential reports listed in Section 14.2.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

4-20 mA Tachometer Shaft Encoder

EN 50014:1997 + Amds 1 & 2 EN 50020:1994 EN 50284:1999 EN 50281-1-1:1999

DIN 19234 Shaft Encoder

EN 60079-0:2006 EN 60079-11:2007 EN 60079-26:2007 EN 61241-0:2006
IEC 60079-0:2007 was used as guidance in respect of marking IEC 61241-11:2005

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC type-examination certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:

4-20 mA Tachometer Shaft Encoder



I M1
II 1 GD (T_a = -20°C to +60°C)
EEx ia I (T_a = -20°C to +60°C)
EEx ia IIC T4 (T_a = -20°C to +60°C)

DIN 19234 Shaft Encoder



I M1
II 1 GD
Ex ia I Ma (T_a = -40°C to +100°C)
Ex ia IIC T4 Ga (T_a = -40°C to +100°C)
Ex ia IIIC T100°C Da

Project Number 21218
C. Index 12

C Ellaby
Certification Officer

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SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE

Sira 00ATEX2085X
Issue 6

13 DESCRIPTION OF EQUIPMENT

The DIN 19234 and 4-20 mA Tachometer Shaft Encoders are used to indicate the angular movement of a shaft. Movement is detected optically by shining light produced by LEDs through a graduated disc that rotates with the shaft. The circuitry is contained on an assembly comprising three printed circuit boards housed in a non-conducting holder, which is installed in an outer metallic enclosure. The equipment is supplied with a flying lead.

The encoders are intended to be powered from one or two galvanic isolators, depending on the model, as follows:

DIN19234 - Each of 2 channels with the following safety description:

$U_i = 13.7 \text{ V}$ $I_i = 63 \text{ mA}$ $P_i = 0.283 \text{ W}$ $C_i = 0$ $L_i = 0$

It is not necessary for the two supplies to be separate intrinsically safe circuits.

4-20 mA Tachometer - One channel with the following safety description:

$U_i = 28 \text{ V}$ $I_i = 100 \text{ mA}$ $P_i = 0.7 \text{ W}$ $C_i = 67.2 \text{ nF}$ $L_i = 0$

Variation 1 - This variation introduced the following changes:

- i. The upper ambient temperature of the DIN 19234 shaft encoder was increased from 60°C to 100°C with a consequential reduction in the P_i value from 0.35 W to 0.283 W/channel.
- ii. The I_i and P_i values of the 4-20 mA Tachometer shaft encoder were increased to 93 mA and 0.7 W respectively (previously 47 mA and 0.33 W).
- iii. To recognise the modification of the circuit in the DIN 19234 build.

Variation 2 - This variation introduced the following changes:

- i. The recognition of minor circuit modifications.
- ii. The safety description was changed; I_i has increased from 93 mA to 100 mA.

Variation 3 - This variation introduced the following change:

- i. Following appropriate re-assessment to demonstrate compliance with the requirements of EN 50284:1999 the marking was amended to include Dust.

Variation 4 - This variation introduced the following change:

- i. The lower ambient temperature was decreased from -20°C to -40°C, the marking being changed accordingly

Variation 5 - This variation introduced the following changes:

- i. Following appropriate re-assessment to demonstrate compliance of the DIN 19234 with the requirements of the EN 60079 series of standards, the documents originally listed in section 9, EN 50014:1997 (amendments 1 and 2), EN 50020:1994 and EN 50284:1999, were replaced by those currently listed, the markings in section 12 were updated accordingly, the condition of certification was modified to recognise the requirements of the latest standards and a Special Condition for Safe Use was introduced with an 'X' suffix being added to the certificate number..
- ii. The introduction of minor mechanical modifications to the DIN 19234.

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EC TYPE-EXAMINATION CERTIFICATE

**Sira 00ATEX2085X
Issue 6**

Variation 6 - This variation introduced the following changes:

- i. The use of a flying lead or a plug and socket was clarified.
- ii. The references to light metal on the new drawings differ from those previously applied, therefore, an additional special condition for safe use was applied.
- iii. The list of drawings relating to the DIN 19234 Encoder was modified to bring it into line with the documents associated with the IECEx certification appertaining to this product.
- iv. The correction of minor typographical errors on the certificate.

14 DESCRIPTIVE DOCUMENTS

14.1 Drawings

Refer to Certificate Annexe.

14.2 Associated Sira Reports and Certificate History

Issue	Date	Report/File no.	Comment
0	24 August 2000	R52X5980A	The release of the prime certificate.
1	20 September 2002	52V9198	The introduction of Variation 1.
2	15 November 2002	52V9698	The introduction of Variation 2.
3	14 May 2003	52V10188	The introduction of Variation 3.
4	1 June 2007	R52A16646B	The introduction of Variation 4.
5	07 May 2009	R52A19698B	This Issue covers the following changes: <ul style="list-style-type: none"> • All previously issued certification was rationalised into a single certificate, Issue 5, Issues 0 to 4 referenced above are only intended to reflect the history of the previous certification and have not been issued as documents in this format. • The introduction of Variation 5, this necessitated the application of special conditions for safe use, therefore, an 'X' suffix was added to the certificate number.
6	7 December 2009	R21218A	The introduction of Variation 6.

15 SPECIAL CONDITIONS FOR SAFE USE (denoted by X after the certificate number)

15.1 Some versions of the equipment are manufactured with an enclosure made from plastic materials. Under certain extreme circumstances, such parts may generate an ignition-capable level of electrostatic charge. Therefore, when the encoder is used for applications that specifically require group II, category 1 equipment, it shall not be installed in a location where the external conditions are conducive to the build-up of electrostatic charge on such surfaces. Additionally, the equipment shall only be cleaned with a damp cloth.

15.2 As the light metal alloy is used at the accessible surface of this equipment, in the event of rare incidents, ignition sources due to impact and friction sparks could occur. This shall be considered when the Encoders are being installed in locations that specifically require group II and I, categories 1G/Ga, M1/Ma equipment.

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Issue 6

16 ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II (EHSRs)

The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed in the reports listed in Section 14.2.

17 CONDITIONS OF CERTIFICATION

- 17.1 The use of this certificate is subject to the Regulations Applicable to Holders of Sira Certificates.
- 17.2 Holders of EC type-examination certificates are required to comply with the production control requirements defined in Article 8 of directive 94/9/EC.
- 17.3 Each completed Shaft Encoder shall be subjected to an electric strength test in accordance with EN 50020:1994 clause 10.6 or EN 60079-11 clause 6.3.12 with the test voltage applied between the circuit and the outer enclosure for a minimum of 60 s. The test voltage shall be 500 Vac (48-52 Hz) or 710 Vdc. The current shall not exceed 5 mA and there shall be no evidence of flashover or breakdown during the test.

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Certificate Annexe

Certificate Number: Sira 00ATEX2085X
Equipment: DIN 19234 Shaft Encoder and
4-20 mA Tachometer Shaft Encoder
Applicant: Hohner Automation Limited



Issue 0

Drawing No.	Sheet	Rev	Date	Title
GA-UH-PCB-001	1 of 1	2	25 Jul 00	General Assembly of Head, Housing and I.S. Head P.C.B's
INTRINSIC DIN 19234	1 of 1	5	15 Jun 00	- [schematic]
LB-DIN-01	1 of 1	2	20 Jul 00	General Label Drawing for the DIN19234
LB-TACHO-01	1 of 1	2	21 Jul 00	General Label Drawing for the 4-20mA Tachometer
TACH4_20-001-02-01	1 of 3	3.0	19 Jun 00	Circuit Diagram A
TACH4_20-001-02-02	2 of 3	3.0	19 Jun 00	Circuit Diagram B
TACH4_20-001-02-03	3 of 3	3.0	19 Jun 00	Circuit Diagram C

Issue 1

Drawing No.	Sheet	Rev	Date	Title
DIN19234-001-03-CCT ①	1 to 2	1.0	26 Jun 02	Schematic – DIN 19234
LB-DIN-02 ②	1 of 1	1.0	27 Jun 02	Label – DIN 19234
LB-TACHO-02 ③	1 of 1	1.0	27 Jun 02	Label – Tachometer

① This drawing replaces INTRINSIC DIN 19234.

② This drawing replaces LB-DIN-01.

③ This drawing replaces LB-TACHO-01.

Issue 2

Drawing No.	Sheet	Rev	Date	Title
LB-TACHO-03	1 of 1	1.0	23 Oct 02	Label – 4-20 mA Tachometer
TACH4_20-001-04-01	1 of 1	1.0	14 Oct 02	Schematic – 4-20 mA Tachometer

Issue 3

Number	Sheet	Rev	Date	Title
GA-DIN-TACHO-01	1 of 1	1.0	30 Apr 03	General Assembly
LB-DIN-03	1 of 1	1.0	31 Mar 03	Label – DIN 19234
LB-TACHO-04	1 of 1	1.0	31 Mar 03	Label – 4-20 mA Tachometer

Issue 4

Number	Sheet	Rev	Date	Title
LB-DIN-03	1 of 1	2.0	10 May 07	General Label Drawing for the DIN 19234

Issue 5

Drawing	Sheets	Rev.	Date	Title
GA-DIN19234-SOLID-02	1 of 1	2	27 Mar 09	General Assembly of Standard Incremental Solid DIN19234 Encoder
GA-DIN19234-HOLLOW-02	1 of 1	2	27 Mar 09	General Assembly for Hollow DIN19234 Encoder
LB-DIN-04-01	1 of 1	1	09 Apr 09	General Label Drawing for the DIN 19234

Issue 6

Drawing No.	Sheets	Rev.	Date (Sira stamp)	Description
AS-HS-002-02	1 and 2	-	23 Nov 09	Hollow shaft encoder assembly
AS-SS-001-02	1 and 2	-	23 Nov 09	Solid shaft encoder assembly
DIN19234-001-03-CCT	1 and 2	1.0	23 Nov 09	DIN19234 Circuit diagrams
Ex-LB-DIN-05	1 of 1	-	07 Dec 09	DIN19234 ATEX Label
IA-LB-DIN-01	1 of 1	-	07 Dec 09	DIN19234 IECEx & ATEX Label

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